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# REPORT OF THE SOUTH CAROLINA SEA GRANT CONSORTIUM

July 1, 1983-June 30, 1984



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# **Report Of THE SOUTH CAROLINA SEA GRANT CONSORTIUM**

## **BOARD OF DIRECTORS**

Major General James A. Grimsley, *Chairman*

President  
The Citadel

Dr. William L. Atchley  
President  
Clemson University

Dr. James B. Edwards  
President  
Medical University of  
South Carolina

Dr. Edward M. Collins  
President  
College of Charleston

Dr. Maceo Nance  
President  
South Carolina State College

Dr. James B. Holderman  
President  
University of South Carolina

Dr. James A. Timmerman  
Executive Director  
S. C. Wildlife and Marine  
Resources Department

Margaret A. Davidson  
*Director*

**Fiscal Year**  
**July 1, 1983-June 30, 1984**



## SOUTH CAROLINA SEA GRANT CONSORTIUM

### STAFF

Margaret A. Davidson, *Director* ..... Charleston  
 Malcome R. DeVoe, *Assistant Director/Research* ..... Charleston  
 Elaine L. Knight, *Assistant Director/Administration* ..... Charleston  
 Judith B. Linder, *Senior Accountant* ..... Charleston  
 James M. Nussman, *Project Coordinator* ..... Charleston  
 Donald L. Sparks, *Special Projects* ..... Charleston  
 Audrey B. Brownlee/Monica L. Mulvey, *Executive Secretary* ..... Charleston  
 Patti Y. Christian, *Secretary* ..... Charleston  
 Anne R. Hill, *Communications Coordinator* ..... Charleston  
 Henrietta S. Wilson, *Public Information Specialist* ..... Charleston  
 Steve Hoffius, *Public Information Specialist* ..... Charleston

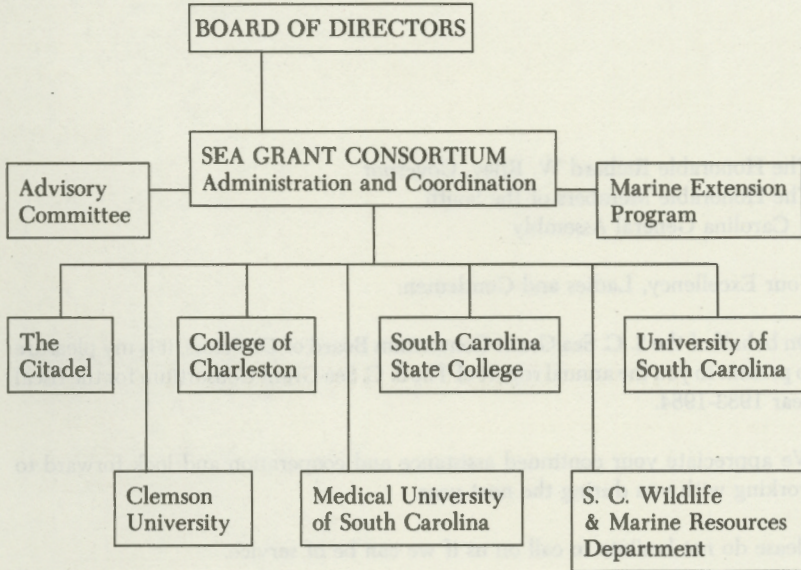
### MARINE ADVISORY SERVICES

Thomas E. Sweeny, *Project Leader* ..... Charleston  
 John L. Keener, *Marine Extension Specialist* ..... Charleston  
 Jack Whetstone, *Marine Extension Specialist* ..... Georgetown  
 Thomas Potts, *Marine Extension Specialist* ..... Beaufort  
 Constance H. Rawls, *Secretary* ..... Charleston



# SOUTH CAROLINA SEA GRANT CONSORTIUM

## ORGANIZATION CHART



## MEMBER INSTITUTION ON-SITE COORDINATORS

Dr. Robert Baldwin  
Department of Biology  
The Citadel

Dr. Thomas C. Cheng  
Marine Biomedicine Research  
Program  
Medical University of  
South Carolina

Dr. Paul B. Zielinski  
Environmental Systems Engineering  
Clemson University

Dr. James Arrington  
Department of Natural Sciences  
South Carolina State College

Dr. Paul Hamill  
Office of Research  
College of Charleston

Dr. Paul A. Sandifer  
Marine Resources Research Institute  
S. C. Wildlife and Marine Resources  
Department

Dr. John M. Dean  
Department of Marine Science  
University of South Carolina



The Honorable Richard W. Riley, Governor  
 The Honorable Members of the South  
 Carolina General Assembly

Your Excellency, Ladies and Gentlemen:

On behalf of the S. C. Sea Grant Consortium Board of Directors, it is my pleasure to present to you the annual report of The S. C. Sea Grant Consortium for the fiscal year 1983-1984.

We appreciate your continued assistance and cooperation and look forward to working with you during the next year.

Please do not hesitate to call on us if we can be of service.

Respectfully submitted,

**BOARD OF DIRECTORS**  
**S. C. SEA GRANT CONSORTIUM**

**DR. JAMES B. HOLDERMAN**  
*Chairman*

## TABLE OF CONTENTS

September 1, 1984

Dr. James B. Holderman  
Chairman, Board of Directors  
S. C. Sea Grant Consortium  
Charleston, South Carolina 29412

Sir:

Attached hereto is the annual report of The South Carolina Sea Grant Consortium, for fiscal year 1983-1984.

This report contains a description of the activities and accomplishments of Sea Grant Consortium programs in marine and coastal research, education, and advisory services. More detailed information is available and can be supplied upon request.

We look forward to working with you and the Board of Directors during this next year.

Respectfully submitted,

**MARGARET A. DAVIDSON**  
*Director*



## TABLE OF CONTENTS

	Page
S. C. Sea Grant Consortium Board of Directors .....	1
S. C. Sea Grant Consortium Staff .....	2
Organizational Chart .....	3
Letters of Transmittal .....	4
The South Carolina Sea Grant Consortium .....	7
Charter Members .....	7
Board of Directors .....	7
Executive Director .....	7
Advisory Committee .....	7
Fiscal Report .....	9
Overview .....	26
Program Development .....	27
Program Description and Review .....	29
Institutional Research .....	31
Marine Education .....	33
Marine Advisory Services .....	34
Communication and Information Services .....	34



## THE SOUTH CAROLINA SEA GRANT CONSORTIUM

Created by South Carolina Act No. 643 in 1978, the principal purpose of the South Carolina Sea Grant Consortium is to provide a mechanism for the development and management of the Sea Grant Program for the State of South Carolina and adjacent regions that share a common environment and resource heritage. The Consortium serves to support, improve and share research, education, training and advisory services in fields related to ocean and coastal resources. The Consortium also encourages and follows a regional approach to solving problems or meeting needs relating to ocean and coastal resources in cooperation with appropriate sea grant colleges, sea grant programs and persons in the region.

### *Charter Members*

The membership of the Consortium consists of The Citadel, the College of Charleston, Clemson University, The Medical University of South Carolina, South Carolina State College, the University of South Carolina and the S. C. Wildlife and Marine Resources Department. These members are designated as charter members.

The terms of the members are perpetual, and a majority of the charter members may vote the admission of a new member into the Consortium.

### *Board of Directors*

The board of directors for the Consortium is comprised of the chief executive officer of each of the participating educational institutions and state agencies or his designee.

### *Executive Director*

The board has the express power to employ the Sea Grant Director, who has the following powers and duties:

1. To direct supervision over all sea grant proposals;
2. To prepare annual sea grant proposals to be submitted to the National Sea Grant Office;
3. To set exact funding levels for proposals submitted by member institutions and subsequently approved by the National Sea Grant Office;
4. To maintain and control the Sea Grant Director's discretionary fund;
5. To request and receive funds from local, state, federal and private sources for use by the director, Consortium, individual member institutions, or other persons;
6. To exercise all incidental powers necessary to carry out the provisions of this act.

### *Advisory Committee*

The Sea Grant Director is assisted by an advisory committee which consists of seven members who serve for four-year terms. Four members are appointed by the Governor with the advice and consent of the Senate. The Chairmen of the



Senate Fish, Game and Forestry Committee, House Agriculture and Natural Resources Committee and South Carolina Wildlife and Marine Resources Commission also appoint one member upon the recommendation of a majority of the members of their respective committees and commission. The four members appointed by the Governor are residents of coastal counties, no more than one from each county, and two are associated with the commercial fishing industry. The initial non-gubernatorial appointees serve for terms of two years only.

# FISCAL REPORT

## BALANCE SHEET

### Fiscal Year 1983-1984

#### Assets

##### Current Funds:

Cash on hand .....	\$ 200
Accounts Receivable .....	430
State Treasurer .....	<u>15,554</u>

\$16,184

##### Restricted Funds:

Due from Grantor .....	\$ 969
State Treasurer .....	<u>20,911</u>

\$21,880

Total Current Funds .....

\$38,064

##### Fixed Assets

Equipment Inventory .....	\$58,863
---------------------------	----------

\$58,863

Total Fixed Assets Funds .....

\$58,863

#### Liability and Fund Balances

##### Current Funds:

Unrestricted .....	\$
Accounts Payable .....	160
Due to State General Fund .....	<u>16,024</u>

\$16,184

Restricted Funds .....

Accounts Payable .....	\$
Deferred Revenue .....	<u>21,880</u>

\$21,880

Total Current Funds

\$38,064

##### Fixed Assets Funds

Funds Balance .....	<u>\$58,863</u>
---------------------	-----------------

\$58,863



STATEMENT OF CHANGES  
IN CURRENT OPERATING FUNDS  
YEAR ENDED JUNE 30, 1984

	<i>Administration</i>
Balance — July 1, 1983 .....	\$ 200
Additions:	
Revenues .....	322,051
Deductions:	
Expenditures .....	<u>306,227</u>
Balance Due to General Fund .....	\$ 16,024

STATEMENT OF CHANGES IN RESTRICTED FUNDS  
YEAR ENDING JUNE 30, 1984

	<i>Balance</i> <i>June 30, 1983</i>	<i>Total</i> <i>Additions</i>	<i>Total</i> <i>Deductions</i>	<i>Balance</i> <i>June 30, 1984</i>
Sea Grant Contracts				
81-82 .....	\$	\$ 15,113	\$ 15,113	\$
Sea Grant Contracts				
82-83 .....	7,056	293,886	300,942	
Sea Grant Contracts				
83-84 .....		316,999	303,194	13,805
Other Restricted				
Contracts .....	<u>8,593</u>	<u>45,947</u>	<u>46,465</u>	<u>8,075</u>
Total .....	<u>\$15,649</u>	<u>\$671,945</u>	<u>\$665,714</u>	<u>\$21,880</u>

STATEMENT OF CHANGES FIXED ASSET FUND  
YEAR ENDED JUNE 30, 1984

	<i>Balance</i> <i>June 30, 1983</i>	<i>Total</i> <i>Addition</i>	<i>Total</i> <i>Deduction</i>	<i>Balance</i> <i>June 30, 1984</i>
Capital Equipment .....	\$40,039	\$ 3,304	-0-	\$43,343
Motor Vehicle Equipment .	<u>13,535</u>	<u>8,722</u>	<u>\$6,737</u>	<u>15,520</u>
Totals .....	<u>\$53,574</u>	<u>\$12,026</u>	<u>\$6,737</u>	<u>\$58,863</u>

STATEMENT OF CHANGES IN CURRENT  
OPERATING FUNDS  
YEAR ENDED JUNE 30, 1984

<i>Revenues:</i>	<i>Administration</i>
State Appropriation .....	\$322,051
Total Revenue .....	322,051
 <i>Expenditures:</i>	
Administration .....	306,227
Total Expenditures .....	306,227
Excess of Revenues Over Expenditures .....	<u>\$ 15,824</u>

SCHEDULE OF CURRENT  
UNRESTRICTED EXPENDITURES  
YEAR ENDED JUNE 30, 1984

	<i>Budgets</i>	<i>Expenditures</i>
Personal Service .....	\$170,007	\$159,343
Fringe Benefits .....	29,189	28,403
Payments to Sub-Grantees .....	60,500	53,576*
Contractual Service .....	18,100	24,741
Supplies .....	10,884	10,628
Fixed Charges .....	22,319	21,093
Equipment .....	1,000	953
Travel .....	7,494	7,490
Salary Increments .....	2,558	
	<u>\$322,051</u>	<u>\$306,227</u>



## \*PAYMENTS TO SUB-GRANTEES

<i>Title</i>	<i>Budget</i>	<i>Expenditures</i>
Travel Support-Larvel Fish Sym —		
SCWMRD .....	\$ 600	\$ 599
Travel Support-NMEA — USC .....	600	600
Cultural Adaptations — USC .....	800	800
Coordinator's Travel-Arrington — SCSC .....	250	235
Coordinator's Travel-Zielinski — Clemson .....	950	736
Coordinator's Travel-Baldwin — Citadel .....	200	39
Groundwater Recharge Potential — Citadel ..	4,000	3,911
Biominalization of Oysters — Clemson .....	4,704	4,264
Coordinator's Travel-Sandifer — SCWMRD ..	500	-0-
Coordinator's Travel-Cheng — MUSC .....	250	-0-
Development of Shrimp Prediction Model —		
MUSC .....	4,200	4,160
Res. Video Tape/Archival Coll — CofC .....	375	324
Technical Info S.C. Seafood & Mariculture —		
SCWMRD .....	5,000	3,879
Coordinator's Travel-Dean — USC .....	700	700
Population Assessment of Black Bass —		
SCWMRD .....	4,000	4,000
Loggerhead Sea Turtle Study — USC .....	1,850	1,676
Study of Trace Metals — SCWMRD .....	3,800	2,842
Pelagre Birds — Citadel .....	3,000	2,878
Subtidal Busycon Fishery — SCWMRD .....	6,100	6,092
City of Charleston Aquarium Study — City of		
Chas. ....	5,000	5,000
Georgetown Cty Development Com. —		
Georgetown Cty .....	500	500
Hard Clam Culture-Pub. — SCWMRD .....	5,400	4,181
Tidal Inlet Dynamics — USC .....	3,200	1,807
Penaeid Shrimp — USC .....	800	800
Supplement to R/ER-4 Task II — USC .....	600	600
Supplement to R/ER-4 Task VII —		
SCWMRD .....	753	753
Pesticide Runoff — USC .....	2,000	2,000
	<u>\$60,132</u>	<u>\$53,376</u>
In House .....		200
		<u>\$53,576</u>

**STATEMENT OF CHANGES IN SEA GRANT CONTRACTS 81-82  
YEAR ENDED JUNE 30, 1984**

	<i>Balance July 1, 1983</i>	<i>Total Additions</i>	<i>Total Deductions</i>	<i>Balance June 30, 1984</i>
USC Coordinator-Travel Support .....		\$ 600	\$ 600	
Summer Res. Grad Support .....		2,030	2,030	
Private Prawn Growers .....		1,060	1,060	
Nursery Culture of Juv. Mollusks .....		1,651	1,651	
Precursor for Groundwater .....		1,772	1,772	
Tidal Inlet Atlas .....		<u>8,000</u>	<u>8,000</u>	
Total .....		<u>\$15,113</u>	<u>\$15,113</u>	

**STATEMENT OF RESTRICTED EXPENDITURES  
SEA GRANT CONTRACTS 1981-82  
YEAR ENDED JUNE 30, 1984**

	<i>Personal Services</i>	<i>Fringe Benefits</i>	<i>Contractual Services</i>	<i>Sub- Grant</i>	<i>Fixed Supplies</i>	<i>Charges</i>	<i>Equipment</i>	<i>Travel</i>	<i>Total</i>
USC Coordinator-Travel Support .....				\$ 600					\$ 600
Summer Res. Grad Support .....				2,030					2,030
Private Prawn Growers ....				1,060					1,060
Nursery Culture of Juv. Mollusks .....				1,651					1,651
Precursor for Groundwater ..				1,772					1,772
Tidal Inlet Atlas Support ...			<u>\$8,000</u>						<u>8,000</u>
			<u>\$8,000</u>	<u>\$7,113</u>					<u>\$15,113</u>



**STATEMENT OF CHANGES IN  
SEA GRANT CONTRACT 1982-83  
YEAR ENDING JUNE 30, 1984**

	<i>Balance July 1, 1983</i>	<i>Total Additions</i>	<i>Total Deductions</i>	<i>Balance June 30, 1984</i>
Sea Grant Administration .....	\$3,392*	\$ -0-	\$ 3,392	
Communications .....	3,664*	19,192	22,856	
Medicinal Agents of the Salt Marsh .....		1,934	1,934	
Teacher Training Use of Mar. Educ. Mats. ....		6,247	6,247	
Age Determination & Ecology of S.C. Swordfish .....		2,757	2,757	
Research Support-Inazuka .....		-0-	-0-	
Cost of the Federal Flood Ins. Program .....		12,003	12,003	
User Fees for Coastal Res. Issues .....		6,199	6,199	
Submerged Lands Conference-Trainee Support .....		500	500	
Coastal Wetland Impoundments Tasks II & IX .....		25,126	25,126	
Toxaphene at N. Inlet Estuary .....		10,698	10,698	
Coastal Wetland Impoundments Task III .....		10,642	10,642	
Coastal Wetland Impoundments Task V .....		3,230	3,230	
Coastal Wetland Impoundments Task VI .....		12,285	12,285	
Travel Support-Colquhoun .....		-0-	-0-	
Coastal Wetland Impoundments Task I .....		-0-	-0-	
Marine Extension Advisory Service .....		53,809	53,809	
Reproduction and Development of Sharks & Rays .....		17,190	17,190	
Power Boaters and Sail Boaters .....		2,000	2,000	
Synthetase from Shrimp .....		8,745	8,745	
Nursery Culture of Juvenile Mollusks .....		6,000	6,000	

	<i>Balance July 1, 1983</i>	<i>Total Additions</i>	<i>Total Deductions</i>	<i>Balance June 30, 1984</i>
Coastal Wetland Impoundments Task I .....		-0-	-0-	
Coastal Wetland Impoundments Task VII .....		20,353	20,353	
Vitro Fertilization of Decapod Crustaceans .....		5,979	5,979	
Coastal Wetland Impoundments Task VIII .....		19,339	19,339	
Coastal Wetland Impoundments Task X .....		7,954	7,954	
Dissemination of Marine Research Info .....		1,500	1,500	
Devlp. & Demo. of Finfish Mariculture .....		8,433	8,433	
Stone Crab Assessment .....		2,468	2,468	
Low Country Science Fair .....		-0-	-0-	
Institute of Marine and Coastal Studies-Travel .....		-0-	-0-	
Lmtd. Entry Mgt. Option of Shrimp .....		3,000	3,000	
Marine Studies on Minority Education .....		4,006	4,006	
Coastal Wetland Impoundments Task IV .....		7,591	7,591	
Purchase of Automobile .....		8,722	8,722	
Sea Map .....		5,000	5,000	
Travel Support-Kachtick .....		984	984	
	<u>\$7,056</u>	<u>\$293,886</u>	<u>\$300,942</u>	

\*Note: Beginning cash balance on Sea Grant Administration and Communications corresponds to ending cash balance for Sea Grant Administration on the financial statement for the year ended June 30, 1983.



STATEMENT OF RESTRICTED EXPENDITURES  
SEA GRANT CONTRACTS 1982-83  
YEAR ENDED JUNE 30, 1984

	<i>Personal Service</i>	<i>Fringe Benefits</i>	<i>Contractual Services</i>	<i>Sub Grant</i>	<i>Supplies</i>	<i>Equipment</i>	<i>Travel</i>	<i>Total</i>
Sea Grant Administration .....	\$3,266	\$ 81					\$ 45	\$ 3,392
Communications .....	1,130	147	\$15,591		\$3,813	\$ 1,674	501	22,856
Medicinal Agents of the Salt Marsh .....				\$ 1,934				1,934
Teacher Training Use of Mar. Educ. Mats. ....				6,247				6,247
Age Determination & Ecology of S. C. Swordfish .....				2,757				2,757
Research Support-Inazuka .....				-0-				-0-
Cost of the Federal Flood Insurance Prog. ....				12,003				12,003
User Fees for Coastal Res. Issues .....				6,199				6,199
Submerged Lands Conference Trainee Support .....				500				500
Coastal Wetland Impoundments Tasks II & IX .....				25,126				25,126
Toxaphene at N. Inlet Estuary .....				10,698				10,698
Coastal Wetland Impoundments Task III .....				10,642				10,642
Coastal Wetland Impoundments Task V .....				3,230				3,230
Coastal Wetland Impoundments Task VI .....				12,285				12,285
Travel Support-Colquhoun ....				-0-				-0-
Coastal Wetland Impoundments Task I .....				-0-				-0-
Marine Extension Advisory Service .....				53,809				53,809
Reproduction and Development of Sharks & Rays .....				17,190				17,190



	<i>Personal Service</i>	<i>Fringe Benefits</i>	<i>Contractual Services</i>	<i>Sub Grant</i>	<i>Supplies</i>	<i>Equipment</i>	<i>Travel</i>	<i>Total</i>
Power Boaters and Sail Boaters .....				2,000				2,000
Synthetase from Shrimp .....				8,745				8,745
Nursery Culture of Juvenile Mollusks .....				6,000				6,000
Coastal Wetland Impoundments Task I .....				-0-				-0-
Coastal Wetland Impoundments Task VII .....				20,353				20,353
Vitro Fertilization of Decapod Crustaceans .....				5,979				5,979
Coastal Wetland Impoundments Task VII .....				19,339				19,339
Coastal Wetland Impoundments Task X .....				7,954				7,954
Dissemination of Marine Research Info. ....				1,500				1,500
Develp. & Demo. of Finfish Mariculture .....				8,433				8,433
Stone Crab Assessment .....				2,468				2,468
Low Country Science Fair ....				-0-				-0-
Institute of Marine and Coastal Studies — Travel ...				-0-				-0-
Lmtd. Entry Mgt. Option of Shrimp .....				3,000				3,000
Marine Studies on Minority Education .....				4,006				4,006
Coastal Wetland Impoundments Task IV .....				7,591				7,591
Purchase of Automobile .....						8,722		8,722
Sea Map .....	4,253	297		984			450	5,000
Travel Support — Kachtick ...								984
	<u>\$8,649</u>	<u>\$525</u>	<u>\$15,591</u>	<u>\$260,972</u>	<u>\$3,813</u>	<u>\$10,396</u>	<u>\$996</u>	<u>\$300,942</u>



STATEMENT OF CHANGES IN  
SEA GRANT CONTRACT 1983-84  
YEAR ENDING JUNE 30, 1984

	<i>Balance July 1, 1983</i>	<i>Total Additions</i>	<i>Total Deductions</i>	<i>Balance June 30, 1984</i>
Administration .....	\$ 32,492		\$ 18,687	\$13,805*
Communications .....	20,683		20,683	
Coastal Impoundments .....	30,825		30,825	
Sea Grant Intern .....	12,642		12,642	
Federal Development .....	12,452		12,452	
Summer Apprentice Support .....				
Coastal Wetlands Impoundments Task Ia .....	10,866		10,866	
Coastal Wetlands Impoundments Task Ib .....	461		461	
Coastal Wetlands Impoundments Task II .....	4,714		4,714	
Coastal Wetlands Impoundments Task III .....	17,771		17,771	
Coastal Wetlands Impoundments Task IV .....	1,443		1,443	
Coastal Wetlands Impoundments Task VI .....	12,560		12,560	
Coastal Wetlands Impoundments Task VII .....	23,998		23,998	
Coastal Wetlands Impoundments Task VIII .....	13,622		13,622	
Coastal Wetlands Impoundments Task X .....	7,567		7,567	
Coastal Wetlands Impoundments Task XI .....	4,082		4,082	
Marine Ed for Pre-College Teachers .....	4,661		4,661	
Growth Rate of Pond Fisheries .....	7,227		7,227	
Marine Extension Program .....	46,928		46,928	
Nursery Culture of Mollusks .....	12,118		12,118	
Development & Demonstration of Finfish .....	8,618		8,618	

	<i>Balance</i> <i>July 1, 1983</i>	<i>Total</i> <i>Additions</i>	<i>Total</i> <i>Deductions</i>	<i>Balance</i> <i>June 30, 1984</i>
Artificial Insemination of Shrimp — MRRI .....		6,910	6,910	
Artificial Insemination of Shrimp — MUSC .....		4,595	4,595	
Anisakiasis in Fish .....		5,885	5,885	
Minority Education Institute .....				
Sea Map .....		13,879	13,879	
		<u>\$316,999</u>	<u>\$303,194</u>	<u>\$13,805</u>

\* Note: Cash balance in Administration account was included in Sub-Contract control in General Ledger

STATEMENT OF RESTRICTED EXPENDITURES  
 FISCAL YEAR ENDING JUNE 30, 1984  
 FEDERAL CONTRACT NO. 1882-84



STATEMENT OF RESTRICTED EXPENDITURES  
SEA GRANT CONTRACTS 1983-84  
YEAR ENDING JUNE 30, 1984

	<i>Personal Services</i>	<i>Fringe Benefits</i>	<i>Contractual Services</i>	<i>Sub Contracts</i>	<i>Supplies</i>	<i>Travel</i>	<i>Equipment</i>	<i>Total</i>
Administration .....	\$ 8,163	\$ 892	\$ 1,696	\$	\$ 180	\$7,275	\$481	\$ 18,687
Communications .....	6,057	913	9,618		3,378	521	196	20,683
Coastal Impoundments ....	21,921	3,695		4,726		483		30,825
Sea Grant Intern .....	7,831	611	3,862			338		12,642
Federal Development .....			2,342	10,110				12,452
Summer Apprentice Support								
Coastal Wetlands Impound- ments Task Ia .....				10,866				10,866
Coastal Wetlands Impound- ments Task Ib .....				461				461
Coastal Wetlands Impound- ments Task II .....				4,714				4,714
Coastal Wetlands Impound- ments Task III .....				17,771				17,771
Coastal Wetlands Impound- ments Task IV .....				1,443				1,443
Coastal Wetlands Impound- ments Task VI .....				12,560				12,560
Coastal Wetlands Impound- ments Task VII .....				23,998				23,998
Coastal Wetlands Impound-								

STATEMENT OF RESTRICTED EXPENDITURES  
SEA GRANT CONTRACTS 1983-84  
YEAR ENDING JUNE 30, 1984

	<i>Personal Services</i>	<i>Fringe Benefits</i>	<i>Contractual Services</i>	<i>Sub Contracts</i>	<i>Supplies</i>	<i>Travel</i>	<i>Equipment</i>	<i>Total</i>
ments Task VIII .....				13,622				13,622
Coastal Wetlands Impound- ments Task X .....				7,567				7,567
Coastal Wetlands Impound- ments Task XI .....				4,082				4,082
Marine Ed. for Pre-College Teachers .....				4,661				4,661
Growth Rate of Pond Fisheries .....				7,227				7,227
Marine Extension Program .				46,928				46,928
Nursery Culture of Mollusks				12,118				12,118
Development & Demonstra- tion of Finfish .....				8,618				8,618
Artificial Insemination of Shrimp — MRRI .....				6,910				6,910
Artificial Insemination of Shrimp — MUSC ....				4,595				4,595
Anisakiasis in Fish .....				5,885				5,885
Minority Education Institute Sea Map .....	11,677	1,218	65			919		13,879
	<u>\$55,649</u>	<u>\$7,329</u>	<u>\$17,583</u>	<u>\$208,862</u>	<u>\$3,558</u>	<u>\$9,536</u>	<u>\$677</u>	<u>\$303,194</u>



# STATEMENT OF CHANGES IN OTHER RESTRICTED CONTRACTS YEAR ENDED JUNE 30, 1984

	<i>Balance July 1, 1983</i>	<i>Total Additions</i>	<i>Total Deductions</i>	<i>Balance June 30, 1984</i>
National Marine Fisheries — Sea Map .....	\$	\$ 4,100	\$ 4,100	\$
Sea Map — Travel .....		885	885	
Coastal Heritage Phase I .....	1,150		1,150°	
Coastal Heritage Phase II .....	5,511		5,511°	
Coastal Heritage Supplement .....	1,000		1,000°	
Sea Level Rise Workshop — EPA .....		969	969	
Dreyfus Foundation .....	932		500	432
National Science Foundation .....		32,250	29,607	2,643
Generated Revenue .....		5,000		5,000
Equal Opportunity Fellowship .....				
Intergovernmental Personnel Act .....		2,743	2,743	
	<u>\$8,593</u>	<u>\$45,947</u>	<u>\$46,465</u>	<u>\$8,075</u>

° \$2,203 refunded to granting agencies

STATEMENT OF OTHER RESTRICTED EXPENDITURES  
YEAR ENDED JUNE 30, 1984

	Personal Service	Fringe Benefits	Contractual Service	Sub Contract	Supplies	Fixed Charges	Travel	Total
National Marine Fisheries —								
Sea Map .....	\$4,100							\$ 4,100
Sea Map — Travel .....							\$ 885	885
Coastal Heritage Phase I ...								
Coastal Heritage Phase II ..	385	\$ 59		\$5,014				5,458
Coastal Heritage Supplement .....								
Sea Level Rise Workshop —								
EPA .....			\$ 828		\$35	\$106		969
Dreyfus Foundation .....			500					500
National Science Foundation .....			21,465				8,142	29,607
Generated Revenue .....								
Equal Opportunity Fellowship .....								
Intergovernmental Personnel Act .....	2,315	428						2,743
	<u>\$6,800</u>	<u>\$487</u>	<u>\$22,793</u>	<u>\$5,014</u>	<u>\$35</u>	<u>\$106</u>	<u>\$9,027</u>	<u>\$44,262</u>



## Notes to Financial Statements

### June 30, 1984

#### *Note 1 — Summary of Significant Accounting Policies*

##### *Basis of Accounting:*

The financial statements have been prepared on an accrual basis.

##### *Fund Accounting:*

To ensure observance of limitations and restrictions placed on the use of resources available to the Consortium, the accounts are maintained in accordance with the principles of fund accounting. This is the procedure by which resources for various purposes are classified for accounting and report purposes into funds that are in accordance with specified activities or objectives. Separate accounts are maintained for each fund.

##### *General Fixed Assets:*

Fixed assets are recorded as expenditures of the general operating fund upon acquisition and subsequently capitalized at actual cost in the general fixed asset account group. In accordance with generally accepted accounting principles prescribed for governmental funds, a provision for depreciation of general fixed assets is not recorded.

##### *Grant Accounting:*

The Consortium is a State agency involved in ocean and coastal research, education, and advisory extension work. It serves to encourage, coordinate and facilitate projects pertaining to coastal and ocean areas of South Carolina and utilize the talents of its members to address marine issues.

The Consortium identifies possible problems of concern to the State of South Carolina which meet Grant criteria. The Consortium then arranges for the design of a project, usually by member agencies, to investigate the problem. On an annual basis, the projects are submitted to grantors for funding. A majority of the projects funded are then sub-contracted to various member agencies.

Expenditures by sub-grantees under the sub-contract which have not been reimbursed to the sub-grantee by the Consortium at June 30, are included in accounts payable. Likewise, expenditures paid or payable by the Consortium at June 30, and not yet reimbursed by the primary grantor are recorded as accounts receivable. Revenues received on specific grants which are in excess of expenditures are recorded as deferred revenues.

#### *Note 2 — Retirement Plan*

Substantially all employees of the Consortium are covered by a retirement plan through the South Carolina Retirement System. It was not feasible to separately identify current year retirement plan cost included as a portion of employer contributions in the accompanying financial statements.



Information regarding the excess, if any, applicable to the Consortium of the actuarially computed value of vested benefits over the total of the pension fund and any balance sheet accruals, less any pension pre-payments of deferred charges is not available. By State Law, the Consortium's liability under the retirement plan is limited to the amounts appropriated therefore in the South Carolina Appropriation Act for the fiscal year 1981, plus the amount paid from other revenue sources for the current year. Accordingly the Consortium recognizes no contingent liability for unfunded costs associated with participation in the plan.

#### *Note 3 — Contingent Liabilities*

The Consortium has numerous contracts with the Federal Government and other State agencies for the reimbursement of specific costs related to the various programs described in each contract. Reimbursement costs subsequently deemed to be unallowable by the sponsoring entity, if any, would have to be repaid. A material amount of the contracts are in-turn sub-contracted by the Consortium and reimbursed costs deemed to be unallowable would result in a claim by the Consortium against the sub-contractor.

#### *Note 4 — Changes in General Fixed Assets*

Changes in general fixed assets for the year ended June 30, 1984 are as follows:

	<i>Balance</i> <i>July 1, 1983</i>	<i>Additions</i>	<i>Deletions</i>	<i>Balance</i> <i>June 30, 1984</i>
Equipment ...	\$53,574	\$12,026	\$6,737	\$58,863



## OVERVIEW

The South Carolina Sea Grant Consortium is a unique partnership of universities, colleges, and state agencies working to promote and implement research, education, and advisory services in the sphere of marine and coastal resources. The Consortium accomplishes these concurrent tasks by drawing on the diverse and extensive talents and expertise available at its seven constituent institutions:

- The Citadel
- Clemson University
- College of Charleston
- Medical University of South Carolina
- South Carolina State College
- South Carolina Wildlife and Marine Resources Department
- University of South Carolina

The Consortium is charged with bringing together and coordinating the diverse and extensive talents and expertise of its constituent institutions to assist the state in resolving coastal and marine issues. Three distinct advantages are realized by this "partnership" mechanism:

- Duplication, often a problem in scientific research, is avoided by encouraging cooperation among the different institutions and among different disciplines within the institutions.
- The promotion of manpower sharing results in greater productivity and lower costs.
- The ability to put together teams of faculty and staff from the various member institutions to help solve problems of concern to the state maximizes the effectiveness of existing personnel at the lowest possible cost. Because of this, the South Carolina Sea Grant Consortium office can operate efficiently with a very small staff.

In its first three years of operation as an independent state agency, the Consortium has expanded its efforts in marine research programs, educational activities, and technical and advisory services: it serves as a "broker" between its member institutions and those individuals, industries, and agencies that can benefit from the results of such a range of programs. The emphasis is placed on applied research based upon the needs identified by potential users; the information gained from Consortium activities is then transferred to those users. In other words, the Consortium acts as an information synthesis and dissemination clearinghouse.

The Sea Grant Consortium is primarily responsible for the administration and management of the Sea Grant Program for the State of South Carolina. The National Sea Grant College Program, signed into law in 1966, awards competitive grants to some 31 coastal and Great Lakes states for the express purpose of accelerating the national development of marine resources, including their conservation, proper management, and economic utilization. It is through research, education, and advisory work that the objectives of the National Sea Grant Program are implemented and realized.



The Consortium thus derives its major funding from two sources — The State of South Carolina and the federal government through the National Sea Grant College Program. Through an annual appropriation from the State, the Consortium receives funding to support the staff, program overhead, and the program development fund. The National Sea Grant Office provides funding primarily for full-scale research, education, and advisory service projects. This commitment by both the state and the federal government in supporting the Sea Grant Consortium is representative of the cooperative nature of the Sea Grant Program in addressing coastal and marine resource issues.

The Consortium is guided in its policy decisions at the state level by its Board of Directors. The Board, which consists of the chief executive of each of the Consortium's member institutions, meets quarterly to review the Consortium's program and to propose new directions for broadening the scope of its activities.

To facilitate the interaction between the Consortium and its member institutions, a Sea Grant Coordinator has been designated by the Director at each of the seven institutions. There, the coordinators serve to further the objectives of the Sea Grant program in the state and to ensure the best utilization of talent and expertise found within Consortium member institutions.

Actual research, education, and advisory work on Consortium projects is, of course, carried out by the faculty and staff at the institutions. Their expertise and talent are the strengths of the South Carolina Sea Grant Consortium; enabling it to meet the challenge of developing and managing coastal resources in an efficient and comprehensive fashion. Both faculty and staff approach this challenge from the variety of perspectives inherent in their multi-disciplinary fields.

In addition to providing professional expertise in many marine and coastal disciplines, member institutions are able to provide a wide range of facilities for use by Consortium project investigators. These investigators have access to more than 30 research laboratories, including those of the South Carolina Wildlife and Marine Resources Department and a large biomedical research facility of the Medical University of South Carolina. Six research vessels are available for field studies. Clemson University possesses the best agricultural engineering facilities for technological development and refinement in the state. Further, among the several field laboratories found throughout South Carolina, the University of South Carolina's 500 square foot Belle Baruch Laboratory in Georgetown County provides a staff of twelve research associates and technicians with a fully equipped facility, including living quarters, and a large conference center.

## PROGRAM DEVELOPMENT

The South Carolina Sea Grant Consortium has instituted a structured mechanism for its program identification and development process. Program areas are identified by the Consortium staff and Institutional Coordinators in consultation with state and federal natural resource agencies, private industry, and Marine Advisory Service personnel. Figure 1 illustrates the program identification and development process followed by the Consortium leading to final review by the National Office of Sea Grant.



For fiscal year 1983-1984, the Consortium received some 90 pre-proposals in response to its call for proposals, totaling more than \$2.3 million. Review of these pre-proposals by the Consortium staff and Institutional Coordinators, and by various state agencies and entities with interests and responsibilities in marine resource development and regulation, was followed by submission of invited, fully developed proposals. These proposals were then reviewed by qualified professionals nationwide. Of these, 16 proposals were included in the FY 1983-84 proposal package to the National Office of Sea Grant for final review and consideration, and 12 were subsequently funded. These are listed in the next section.

In addition to federal Sea Grant project support, the Consortium Director is provided federal and state discretionary funds to allow for program flexibility and prompt response to high priority needs, to encourage innovative ideas and approaches, and to provide special support as needs arise. A sizeable number of discretionary projects were funded during FY 1983-84 in program areas that will provide a base of information to build and strengthen the Sea Grant Consortium program in future years. These projects include:

### STATE DEVELOPMENT FUNDS — FY 83-84

- SD 84-1 — "Attendance — Ontology and Systematics of Fishes: An International Symposium — 8/15-18/83" — Dr. Charles Wenner (MRRI) —
- SD 84-2 — "Attendance — Natural Marine Education Association Annual Conference — 8/2-6/83" — Dr. Wendy Allen (USC) —
- SD 84-3 — "Cultural Adaptations in the Barrier Island Environment: An Archeological Assessment" — Dr. Larry Lepionka (USC-B) —
- SD 84-4, 5, 6 — "Travel Support: Campus Coordinators" —  
     Dr. James Arrington (S. C. State)  
     Dr. Paul Zielinski (Clemson) —  
     Dr. Robert Baldwin (The Citadel)
- SD 84-7 — "Groundwater Recharge Potential of Freshwater Wetlands, Hilton Head Island, S. C." — Dr. James May (The Citadel) —
- SD 84-8 — "Identification of Potential Regulations of Biomineralization from the Organic Matrix of the Shell of the Oyster, *Crassostrea virginica*" — Dr. A. P. Wheeler (Clemson) —
- SD 84-9, 10 — "Travel Support: Campus Coordinators: —  
     Dr. Paul Sandifer (MRRI) —  
     Dr. Tom Cheng (MUSC) —
- SD 84-12 — "Development of Shrimp Prediction Models for South Carolina Commercial Shrimp Landings" — Dr. Chan F. Lam (MUSC) —
- SD 84-13 — "Restoration of Videotapes on Coastal Heritage Arts and Crafts for Archival Collection" — Dr. K. B. McIntosh and Dr. P. H. Yaun (C of C) —
- SD 84-14 — "Technical Information Sources for South Carolina's Seafood and Mariculture Industries" — Dr. Raymond Rhodes (MRRI) —
- SD 84-15 — "Travel Support: Campus Coordinators" — Dr. John M. Dean (USC) —



- SD 84-16 — "Visual Population Assessment of Black Sea Bass of the Mid-Shelf Live Bottom Areas — Phase I" — Dr. Charles Barans (MRRI) —
- SD 84-17 — "Possible Separation of Two Loggerhead Sea Turtle Populations by Their Carapace Epibionts" — Dr. Edsel Caine (USC-B)
- SD 84-18 — "A Comparative Study of Trace Metals in Oysters" — Dr. Tom Mathews (MRRI)
- SD 84-19 — "Distribution of Abundance of Pelagic Birds Off the South Carolina Coast" — Dr. Dennis Forsythe (The Citadel) —
- SD 84-20 — "Development of Management Software for the Subtidal *Busycon* Fishery" — W. D. Anderson (MRRI) and A. G. Eversole (Clemson)
- SD 84-21 — "Feasibility Study on the Need for a Public Aquarium in Charleston, S. C." — R. Blackburn (City of Charleston) —
- SD 84-22 — "Carolina Crawfish Marketing Event" — J. M. Kendree (GCDC) —
- SD 84-24 — "Supplemental Support for the Publication of a Text on Clam Culture in North America" — J. J. Manzi (MRRI) —
- SD 84-25 — "Tidal Inlet Dynamics — Captain Sam's Inlet, South Carolina" — T. W. Kana (USC)
- SD 84-27 — "Support for a Survey on Penaeid Shrimp Aquaculture" — C. A. Wilson (USC)
- SD 84-28 — "Coastal Wetland Impoundment Project — Task II — Supplemental Support" — M. E. Tompkins (USC)
- SD 84-29 — "Coastal Wetland Impoundment Project — Task VII — Supplemental Award" — E. L. Wenner (MRRI)
- SD 84-30 — "Studies on the Effects of Agricultural Pesticide Runoff to Estuarine Organisms in South Carolina" — G. I. Scott (USC)

## SEA GRANT PROGRAM DESCRIPTION AND REVIEW

The South Carolina Sea Grant Consortium manages and administers the Sea Grant Institutional Program for the state. As its primary responsibility, the Consortium develops a program that focuses on institutional research, marine education, and marine advisory services. Since 1980, the Consortium has administered over \$4 million in federal and state-appropriated funds for over 180 research, education, and advisory service projects. For the 1983-84 fiscal year, some 37 projects were funded at a combined federal-state level of over \$1,000,000. More importantly, however, is the fact that major economic effects accrue to the state, the region, and, in many cases, the nation from these investments.



## CONSORTIUM PROJECT IDENTIFICATION AND DEVELOPMENT PROCESS

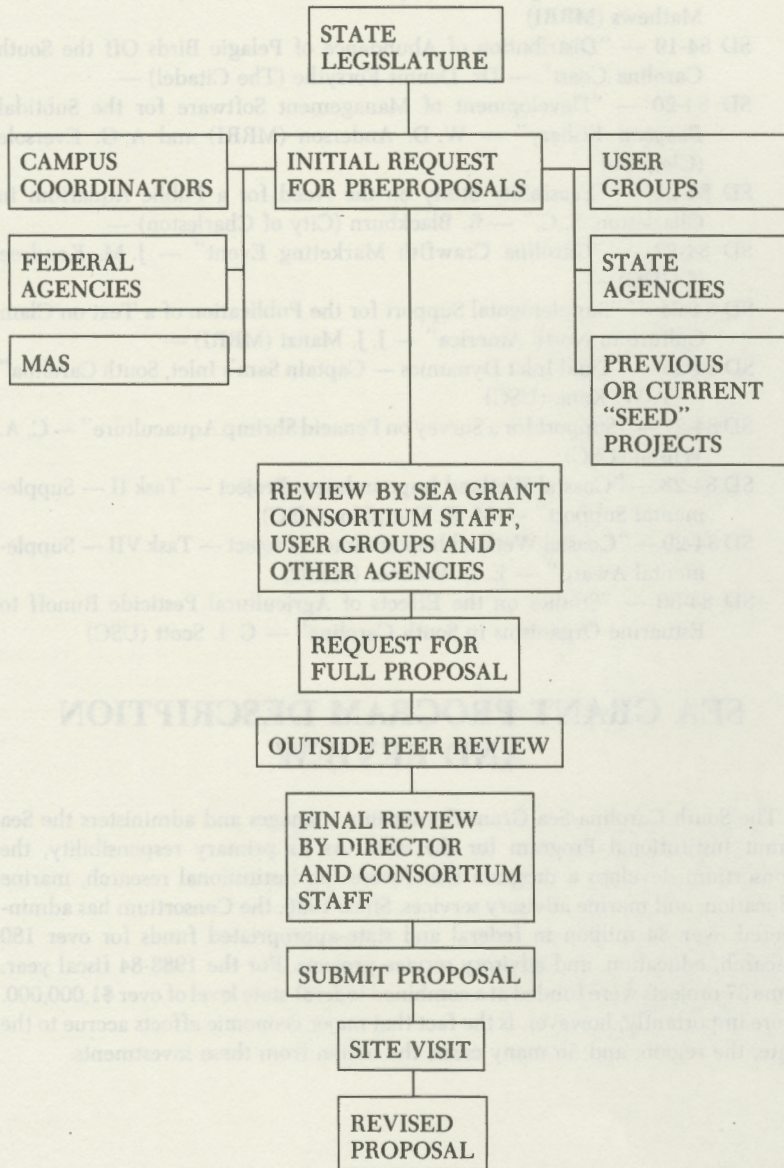


Figure 1



## INSTITUTIONAL RESEARCH

Marine and coastal research programs undertaken by Consortium institutional investigators can be divided into six functional categories:

- Aquaculture Development and Management
- Coastal Impoundments
- Fisheries Development and Management
- Marine Education
- Advisory Services
- Communications

### PROGRAM DESCRIPTION AND REVIEW

In its three years as a fully operational, independent state agency, the South Carolina Sea Grant Consortium has given preliminary consideration to a wide range of marine related projects. This section provides the reader with a brief overview of the 13 fully developed proposals selected, grouped into six functional categories: Aquaculture Development and Management; Impoundment Studies; Fishery Development and Management; Marine Education, Advisory Services and Communications.

#### AQUACULTURE DEVELOPMENT AND MANAGEMENT

Aquaculture research and development has evolved slowly in the United States as compared with the major aquaculture countries of the world. However, with growing consumer desire for seafood creating increasing demand, the concept of aquaculture has been gaining more and more attention. This is true for South Carolina where a variety of species, including prawns, hard clams, tilapia, baitfish (minnows), catfish, crawfish, and striped bass are being either utilized or examined because of their desirability as aquaculture species. The South Carolina aquaculture effort is expected to increase dramatically with the February 1984 opening of the James M. Waddell, Jr. Mariculture Research and Development Center at Victoria Bluff, South Carolina. Further, the State possesses a variety of features, e.g., its climate and physiography, that make it well-suited to the culture of these and other species.

The aquaculture of finfish has shown great promise in South Carolina, and has been the source of innovative cooperation between the public and private sectors. The final year objective of a continuing effort (R/A-12 Smith and Sandifer) sought to complete the development and demonstration of large-scale commercial culture of hybrid bass in net pens in South Carolina coastal waters. This project provided the initial biological basis for the eventual establishment of large-scale production of hybrid bass in estuarine net pens.

The second project in this category sought to complete the comparison of various culture systems used in the early growout stages of juvenile *Mercenaria mercenaria* (hard clams) (R/A-13 Manzi). Traditionally, raceway and watertable culture systems have been used in this country, but two upwelling systems, used in colder European climates for the culture of oysters, have shown potential for clam culture systems in southeastern United States. Already, project results have been



used by three commercial facilities in the initial design and construction of upflow systems for the nursery culture of post-set mollusks.

Despite recent advances in artificial insemination techniques, these methods remain quite crude and much refinement is needed for their routine successful application, especially for breed improvement work. A new proposal in this category (R/A-14 Sandifer) sought to develop improved methods for obtaining spermatophore from male shrimp while causing them minimal harm. The development of improved techniques should: increase yields of nauplii from maturation facilities and sourcing cruises; lower the operating costs and increase the profitability of shrimp culture enterprises; and produce genetic improvement of penaeid species for culture.

### *COASTAL WETLAND IMPOUNDMENT STUDIES*

In South Carolina, some 14-16% of an estimated 200,000 hectares of wetland is currently impounded, primarily as a result of the flourishing rice culture industry during the 19th and very early 20th centuries. Interest in utilizing the inherent productivity of impounded wetland areas has increased dramatically in the recent past. It is conceivable that impoundment utilization could constitute a significant new economic activity along the southeast Atlantic coast. However, there are many questions that have arisen from the increasing level of interest in utilizing impoundments in South Carolina and elsewhere in the region.

It is for these and other reasons that the Coastal Wetland Impoundment project (R/ER-4) was proposed for Year 2 funding. The second year proposal was restructured to incorporate a centralized project management mechanism for more effective oversight and coordination of the 12 project Tasks. Task investigators from 5 Consortium institutions proposed to continue (1) acquiring basic data on the ecology of impounded wetlands, (2) elucidating the ecological relationships between impoundment wetlands and their surrounding environments, (3) comparing the production performance of commercially valuable species in impoundments with that in adjacent open wetlands, (4) assessing the economic values of impoundments in comparison to the value of unperturbed wetlands in similar environments, and (5) identifying those issues resulting from state and federal policies and laws relevant to impoundment management and use.

The proposed research provided much-needed data and information regarding the dynamics of important and unique wetland ecosystems — impoundments — and their influence upon adjacent open wetlands. In addition, proposed manipulative studies provided resource managers and users with important preliminary data on the management of indigenous species and the culture of commercially valuable crustaceans and finfish. The development of a set of recommendations for impoundment management will assist these and other private state and federal natural resource user groups in their efforts.

### *FISHERIES DEVELOPMENT AND MANAGEMENT*

Although commercial aquaculture in South Carolina may prove to be an excellent supplementary source of needed seafood products, it can only be expected to provide a fraction of consumer seafood demand in the near future. Thus, the growing demand for seafood must be satisfied by the natural fisheries of



the state and region. For the short term, research in all aspects of the development and management of South Carolina's natural fisheries must continue. Fisheries research conducted by Consortium investigators serves to augment that of the various state and federal fisheries management and regulatory bodies in South Carolina.

Consortium biological research in commercial fisheries has focused on such traditional species as snappers and groupers, flounders, clams, oysters, and shrimp, and on several underutilized species including shark and knobbed whelk. In addition, studies on recreational fisheries have focused on swordfish and baitfish.

Anisakiasis has been recognized as a significant pathological disease in marine fish for over 60 years. This disease slowly immobilizes the fish to such a degree that they are unable to capture food, especially in the case of carnivorous species. Further, in 1955, a new human disease was recognized in the Netherlands which is now known as anisakiasis. Over 140 proven cases have been reported there between 1955 and 1967, and thousands of cases have been identified in Japan. In North America, over 100 cases are known to have occurred since 1972. Thus, a new project (R/PO-3 Cheng) was proposed to (1) determine, quantitatively and systematically, the species, the life cycle stages, and the seasonality of the occurrence of anisakids in selected, commercially important species of marine fish, (2) test the infectivity of the identified anisakid nematode species on laboratory mammals, and (3) test the effects of temperature as a means of inactivating or killing anisakid nematodes. The proposed study was one of the first concerted efforts in North America (restricted at the present to South Carolina) to identify and provide a solution to a new, but dangerous, human disease, and provided data for state public health officials, sports and commercial fishermen, restaurants, and seafood producing plants.

## MARINE EDUCATION

The South Carolina Sea Grant Consortium established a Sea Grant Marine Education Study Group as one of its first actions in administering the state's Sea Grant Program. The Study Group, established in order to provide for the development of the educational component of the South Carolina Sea Grant Program, was charged with the task of assessing various educational activities that would be appropriate for Sea Grant support in South Carolina and developing a series of recommendations as to which activities would best serve Sea Grant educational goals. The two marine education projects proposed in this year were generated as a response to the recommendations of the Marine Education Study Group.

The first proposal in this category (E/TT-2 Allen) sought to build upon previous marine education activities by expanding and strengthening the Grades K-12 marine education program in South Carolina. The project resulted in a core group of teachers highly trained in marine and environmental issues, a detailed survey of existing materials, educational packets containing trial-tested and adopted marine education activities, and new instructional materials to fill gaps in these materials as identified by the teachers.

The second year of a continuing project (E/O-8 Arrington) sought to increase the participation of ethnic minorities in the marine sciences by providing opportunities for participation in ongoing marine research activities. Specifically, the



investigation intended to provide both academic year and summer undergraduate research apprenticeships with the University of South Carolina, the Medical University of South Carolina, the National Marine Fisheries Service Laboratory in Charleston, South Carolina, and the S. C. Wildlife and Marine Resources Department. This cooperative educational effort permitted a focusing on new careers in marine science that currently are pursued by very few minority students and, at the same time, the black community became more aware of the importance of the marine environment and its resources.

### **MARINE ADVISORY SERVICES**

The South Carolina Marine Advisory Service (A/E-1 Sweeney) is the extension arm of the Sea Grant Consortium. Its purpose is to provide information to coastal constituents, both public and specific user groups, concerning coastal and marine resource use and management. This information is provided for all levels of educational experience and utilizes audio visuals, pamphlets, radio, television and in-person counseling.

Among the many activities proposed for FY 83-84, MAS continued to work closely with commercial fishing interests in further refinement and utilization of TED's in cooperation with the National Marine Fisheries Service. Further efforts in the development and implementation of the MAREP system were continued in conjunction with the National Weather Service. The fledgling aquaculture industry was assisted by MAS to a greater degree, involving workshops and MAS publications. Coastal recreation activities began.

The Marine Advisory Service designs its activities to meet the need of marine resource users and provides the information necessary to ensure wise and effective use of South Carolina's marine resources. Through Marine Advisory Service identification of needs, research efforts can be identified and conducted in a responsive and efficient manner. Marine Advisory Service cooperative efforts in the development of new technology and provision of advisory services to coastal and marine-related businesses will enhance the sound growth of the economy of South Carolina.

### **COMMUNICATIONS AND INFORMATION SERVICES**

The Consortium initiated its communications program (A/C-1) in September, 1981. However, it was not until the Fall, 1982 that the program had a functional Communications staff on board. The Communications program has continued to produce technical reports and to pursue the other activities that have made it a strong component of the Consortium's efforts. This year, the program also broke new ground, proposing new methods of information dissemination and establishing new systems to support the growth and increased sophistication of the Consortium. A publications "core group" and a computer-based data system were among the new procedures instituted to ensure an efficient and effective Communications program within the Consortium.

Emphasis for the FY 83-84 program year was placed on expanding the communications program to encourage effective interaction with the internal and external components of the Consortium. Communication and information activities are designed to ensure that concerned audiences receive the benefit of Sea



Grant research, education, and advisory activities. General program objectives as well as specific projects proposed for this year encouraged increased information dissemination and communication links among Consortium staff, Sea Grant researchers, the National Sea Grant College Program, and other Sea Grant programs: they also helped promote Sea Grant throughout the state, region, and nation.

### *PUBLICATIONS 1983-1984*

In addition to the many journal articles about Sea Grant sponsored research published by Sea Grant researchers, the South Carolina Sea Grant Consortium produced the following publications during 1983-1984.

- A is for Alligator, B is for Beaches
- Coastal Heritage Bulletin #6
- Coastal Heritage Bulletin #7
- Aquaculture in South Carolina
- Emergency Numbers for Marine Problems
- Lobster Landing Data Sheets
- Beach Erosion Inventory for Charleston County
- An Interim Guide to Aquaculture Permitting in S. C.
- A Salt Water Fishing Guide
- Report on a Model Strategy for Coastal & Marine Resources Management & Protection — Case Study: Mauritius
- The Regional Workshop for Coastal & Marine Management & Protection in East Africa and the Indian Ocean — Workshop Final Report
- Report on a Management Strategy for the Conservation and Development of Coastal & Marine Resources of the East Africa Indian Ocean Region — Programme of Action